

Should the CPUC Grant Access to Utility Ratepayer Subsidizes to Ensure LNG Terminals are Built to Serve the California Market?

October 2, 2004

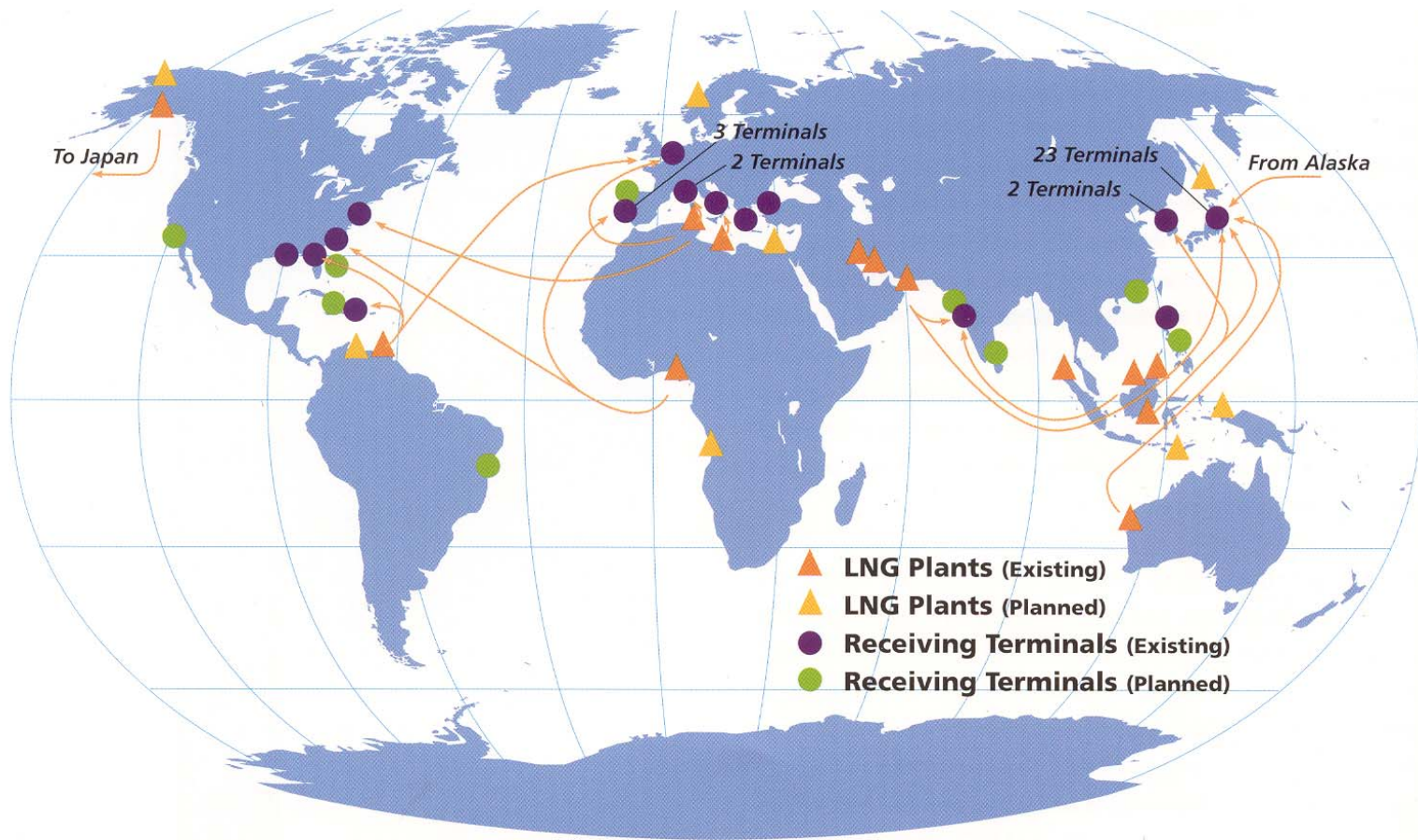
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Worldwide view of LNG supply chains



Where is gas coming from to make LNG for California?

Clockwise from left: Camisea pipeline, Peru; offshore Sakhalin, Russia; Bintuni Bay, West Papua, Indonesia; Barrow Island, Australia



LNG liquefaction, tanker and receiving operations



Rigorous evaluation of LNG need – Has it been done? No.

- May '03 Energy Action Plan, Action No. 6:
 - Evaluate the net benefits of increasing the state's natural gas supply options, such as liquefied natural gas;
 - Monitor the gas market to identify any exercise of market power and manipulation, and work to improve FERC-established market rules to correct any observed abuses.

EAP loading order and risks of increased dependence on natural gas

Energy Action Plan loading order:

- Increase conservation and energy efficiency to minimize increases in electricity and natural gas demand;
- Meet demand for new generation with renewables and distributed generation;
- Add clean, fossil-fuel, central station generation.

CEC Integrated Energy Policy Report, December 2003:

- “. . . Natural gas generation expected to increase from 36% in 2004 to 43% in 2013.”
- LNG is opportunity to access supply from other continents, may help downward pressure on price, although overdependence on foreign supply is concern.

Senator Orrin Hatch, December 2003 – *“Must determine if price surges are result of market forces or manipulation.”*^a

a) Surge in Natural Gas Prices Brings Fear of Sharply Higher Heating Costs, Canadian Press, 12/16/03



Natural Gas Supply, Demand, and Price:

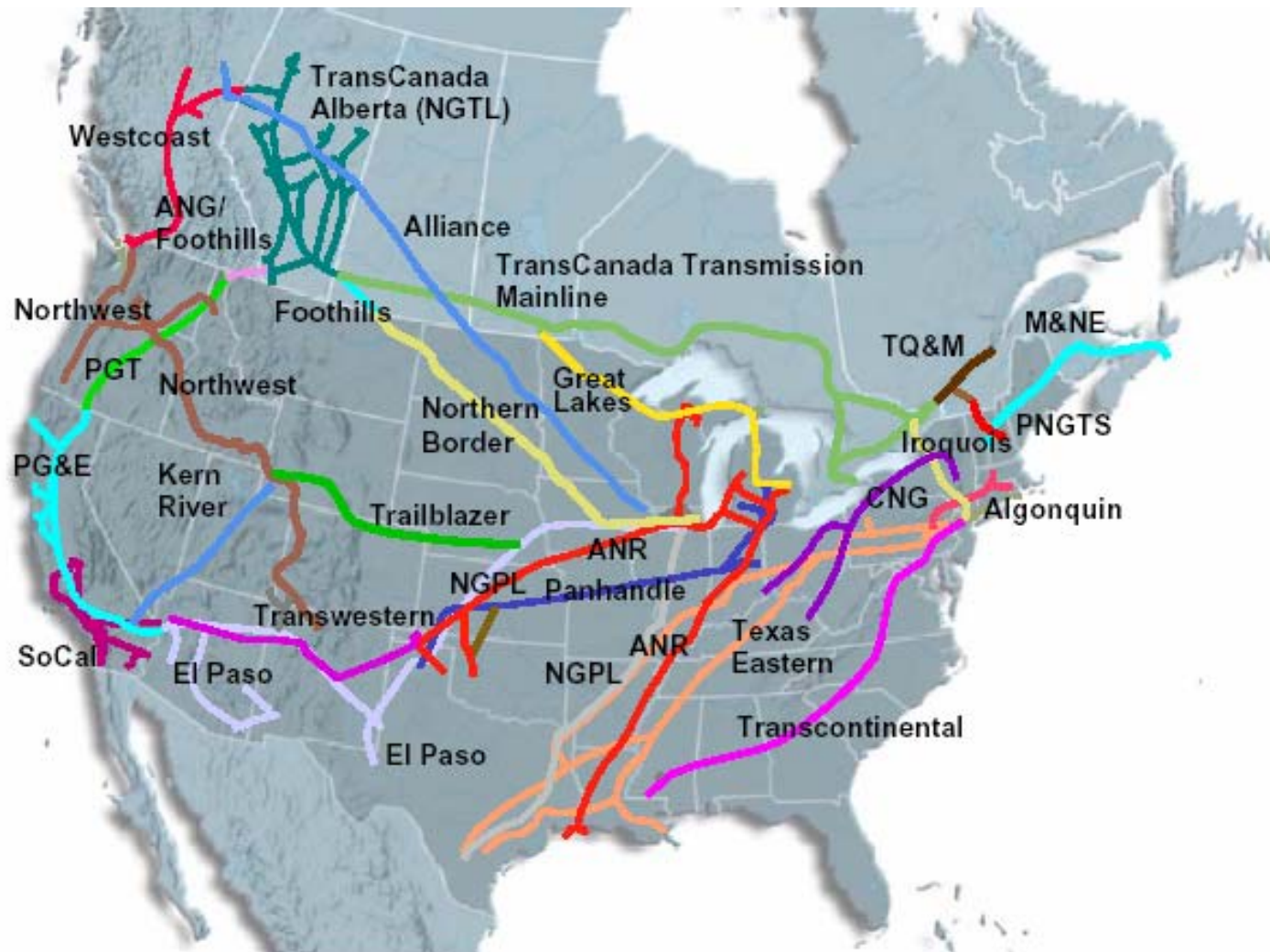
Do We Need LNG to Prevent Another Energy Crisis in California?

California Natural Gas 101

U.S. daily usage rate (billion cubic feet per day - Bcfd)	60 Bcfd
California daily usage rate	6 Bcfd
Utility core customer usage	1.5 – 2 Bcfd
Utility non-core customer usage (powerplants, industrial)	4 – 4.5 Bcfd
Capacity of one LNG terminal	1 Bcfd
Current sources of gas reaching California	Permian Basin (TX), San Juan Basin (NM), SW Wyoming, Alberta (Canada), California

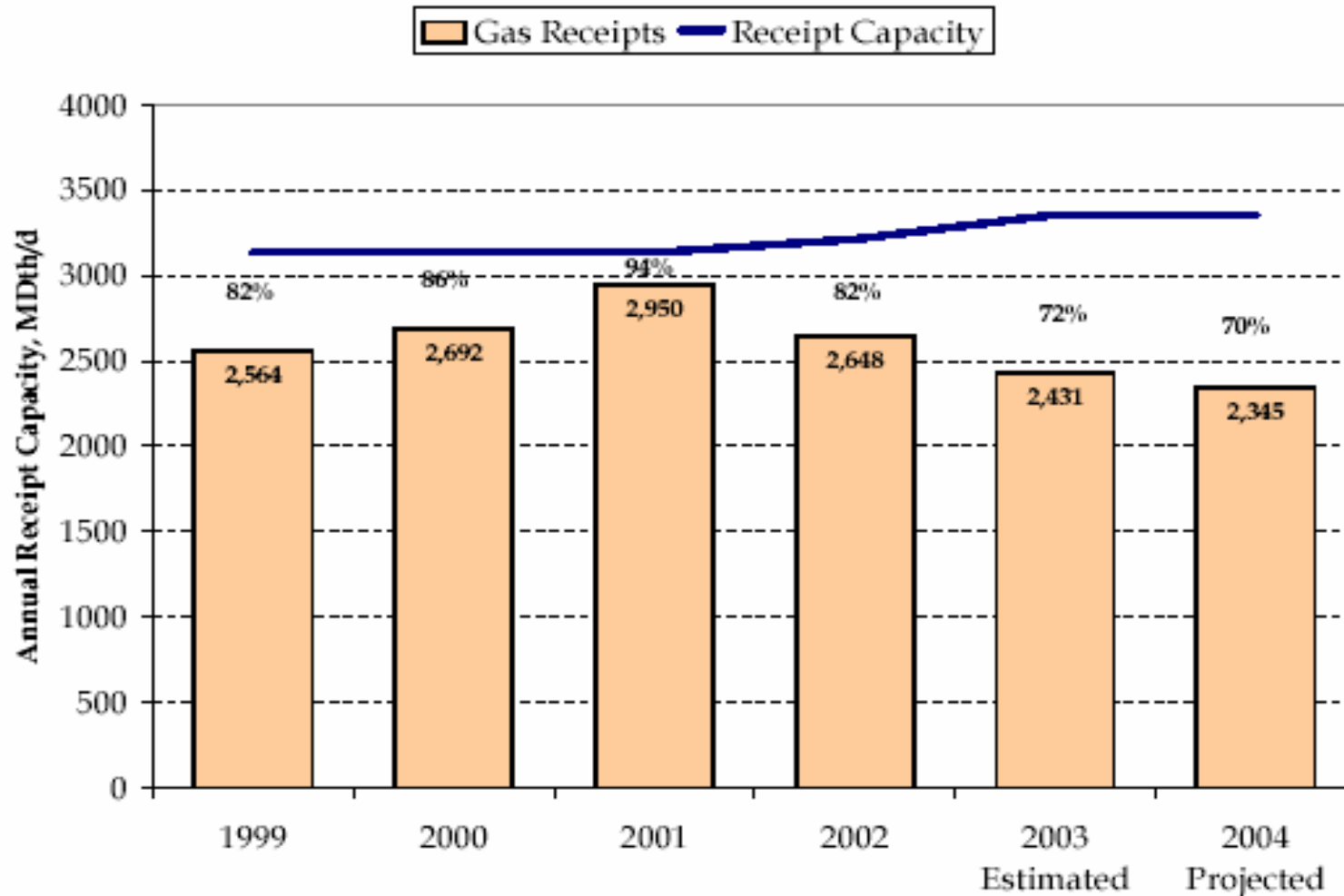
North American Pipeline Infrastructure Map

From: Greg Stringham, Canadian Association of Petroleum Producers, *Canadian Natural Gas – An Important Part of North American Supply, Now and In the Future*, National Energy Modeling System/ Annual Energy Outlook Conference, March 2004



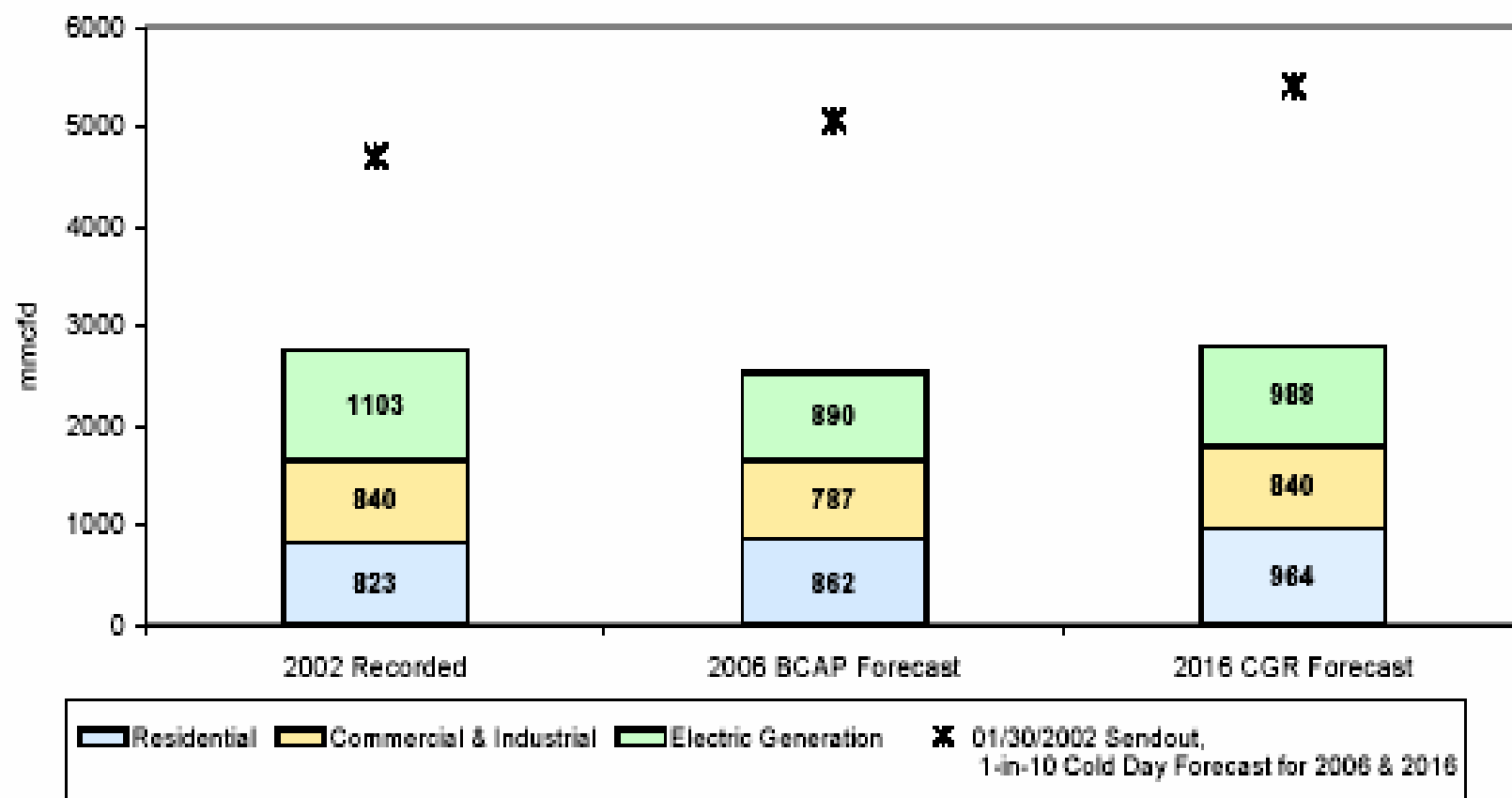
PG&E's historical demand and load factor

From: Les Buchner, Manager PG&E, *Forecast of Demand Natural Gas Market Outlook 2006 –2016*, CPUC/CEC Workshop, December 9, 2003, San Francisco.



SoCalGas & SDGE demand trends

From: Jeff Hartman, Director Energy Markets and Capacity Products SoCalGas/SDGE, *Future Demand for Natural Gas in Southern California: 2006 –2016*, CPUC/CEC Workshop, December 9, 2003, San Francisco.



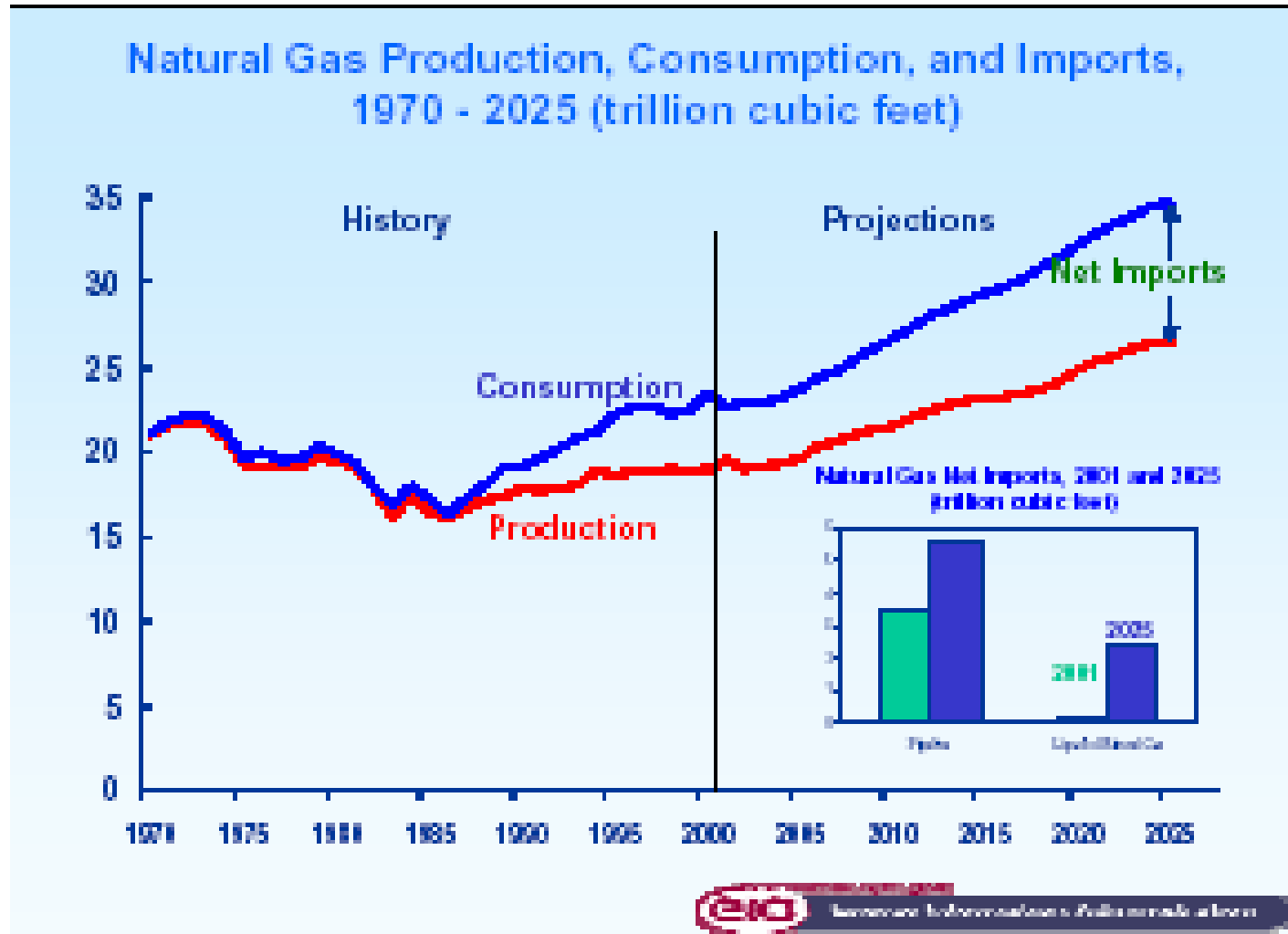
Are we running out of domestic supplies of natural gas? No.



- What the Department of Energy says:
 - Combined U.S. and Canadian production will increase by 50% from 2001 to 2025, in response to 1.8% per year assumed growth rate in demand;
 - Primary growth area is electric power production.
- What some LNG developers say:
 - California running out of domestic supplies, another source of supply is needed to diversify supply sources, avoid crisis, and lower prices.

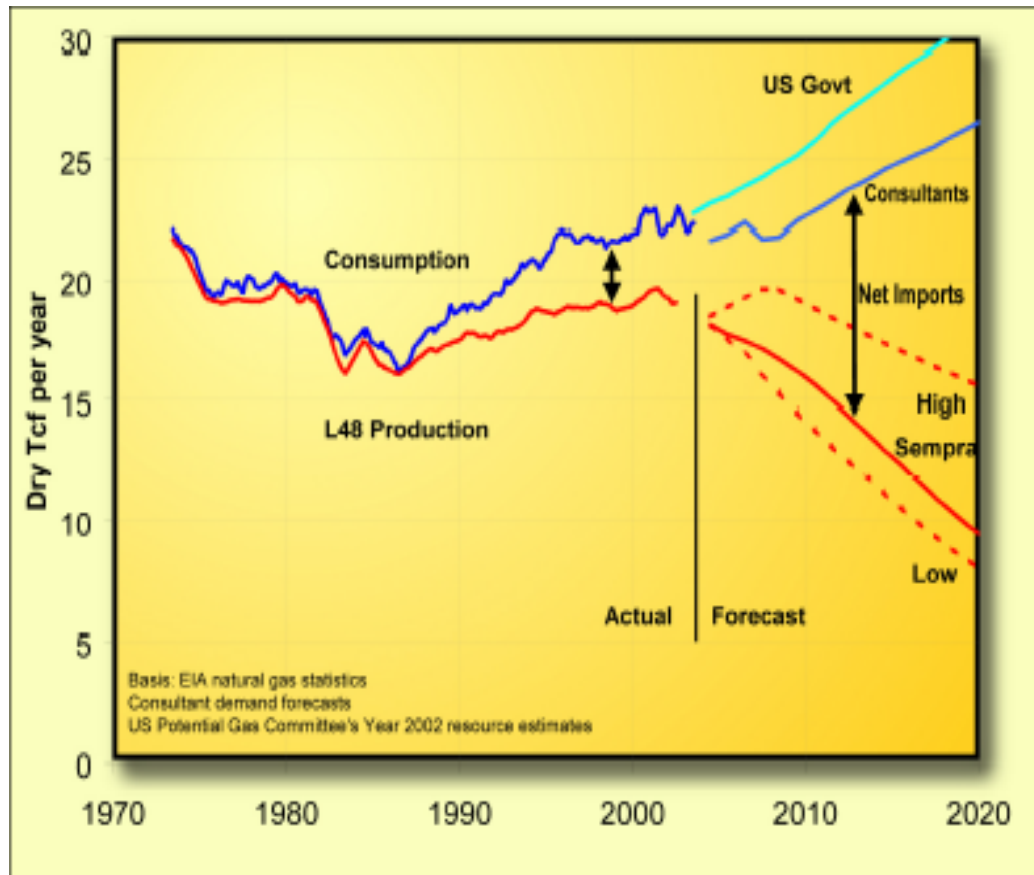
U.S. domestic natural gas production, along with Canadian production, will rise considerably to meet demand growth projected at 1.8% per year

From: James Kendell, DOE EIA, *Current Natural Gas and LNG Projections*, National Association of Regulatory Utility Commissioners, July 29, 2003



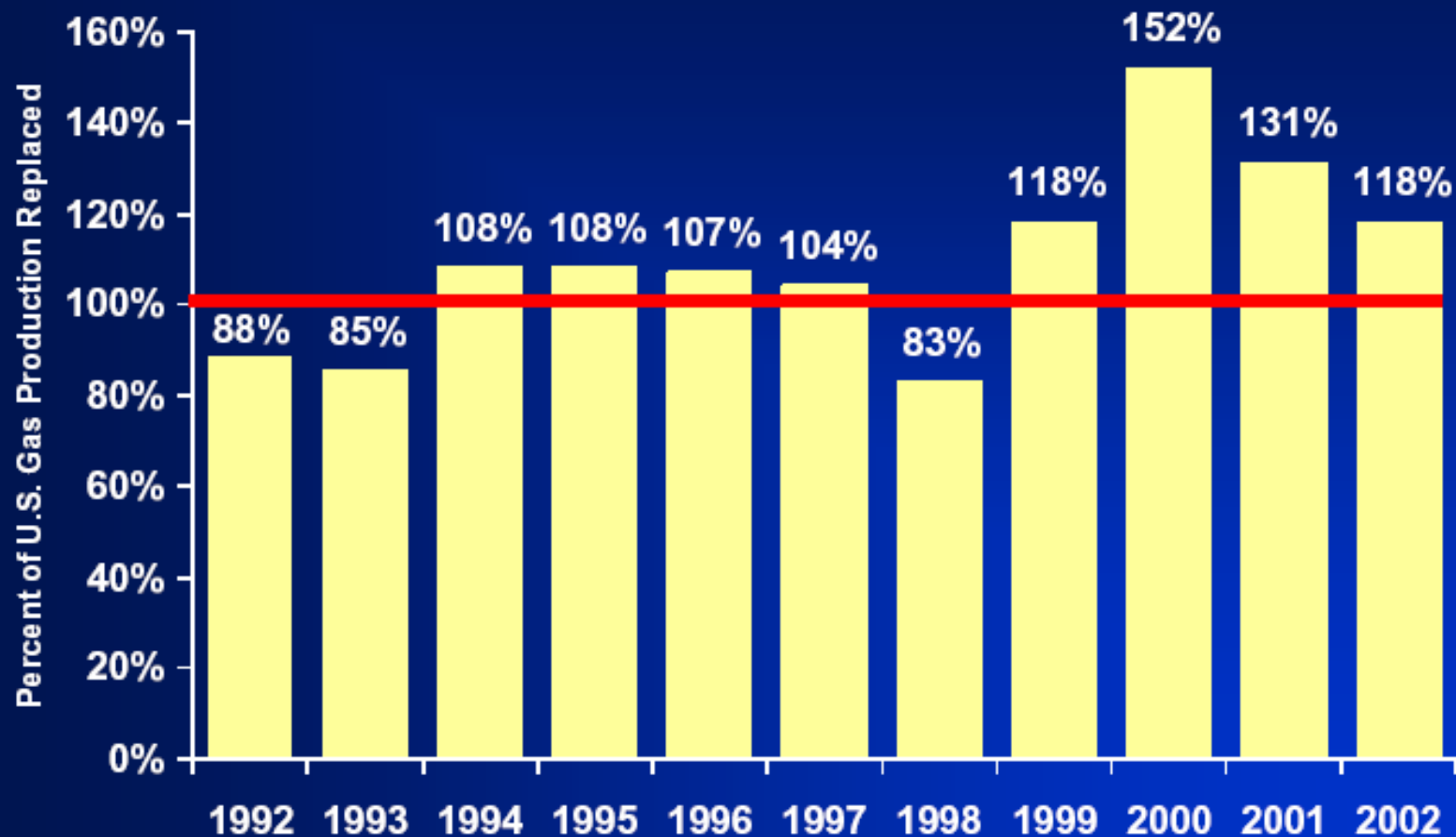
Sempra perspective – crisis in domestic natural gas output

From: presentation by Greg Bartholomew, VP Gas Strategies, Sempra LNG, CPUC/CEC natural gas 2006-2016 workshop, December 10, 2003, San Francisco.



- “California has little choice but to allow the development of LNG terminals”
- “The only decision is where and how”

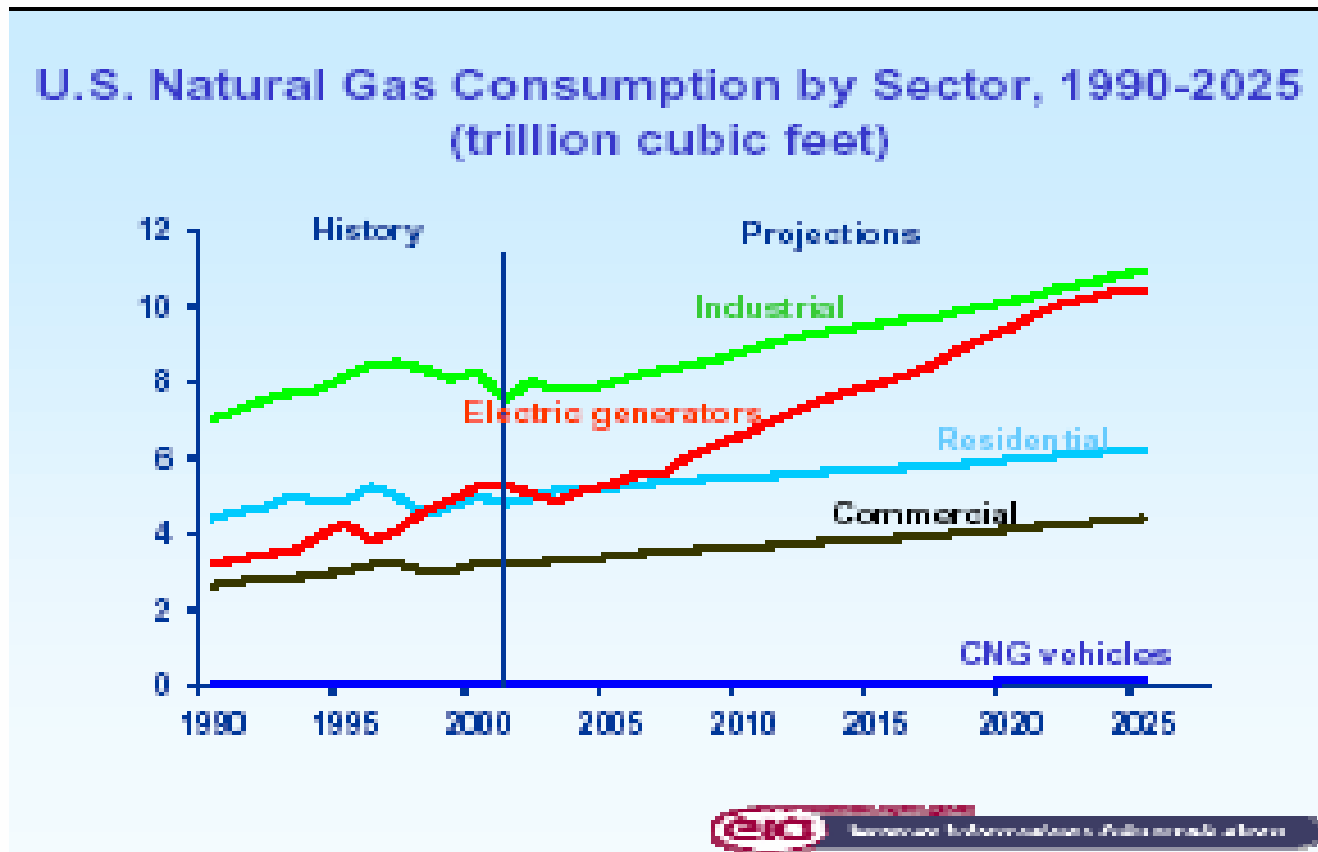
Reserve Additions Exceeded Production for 8 of the Last 9 Years



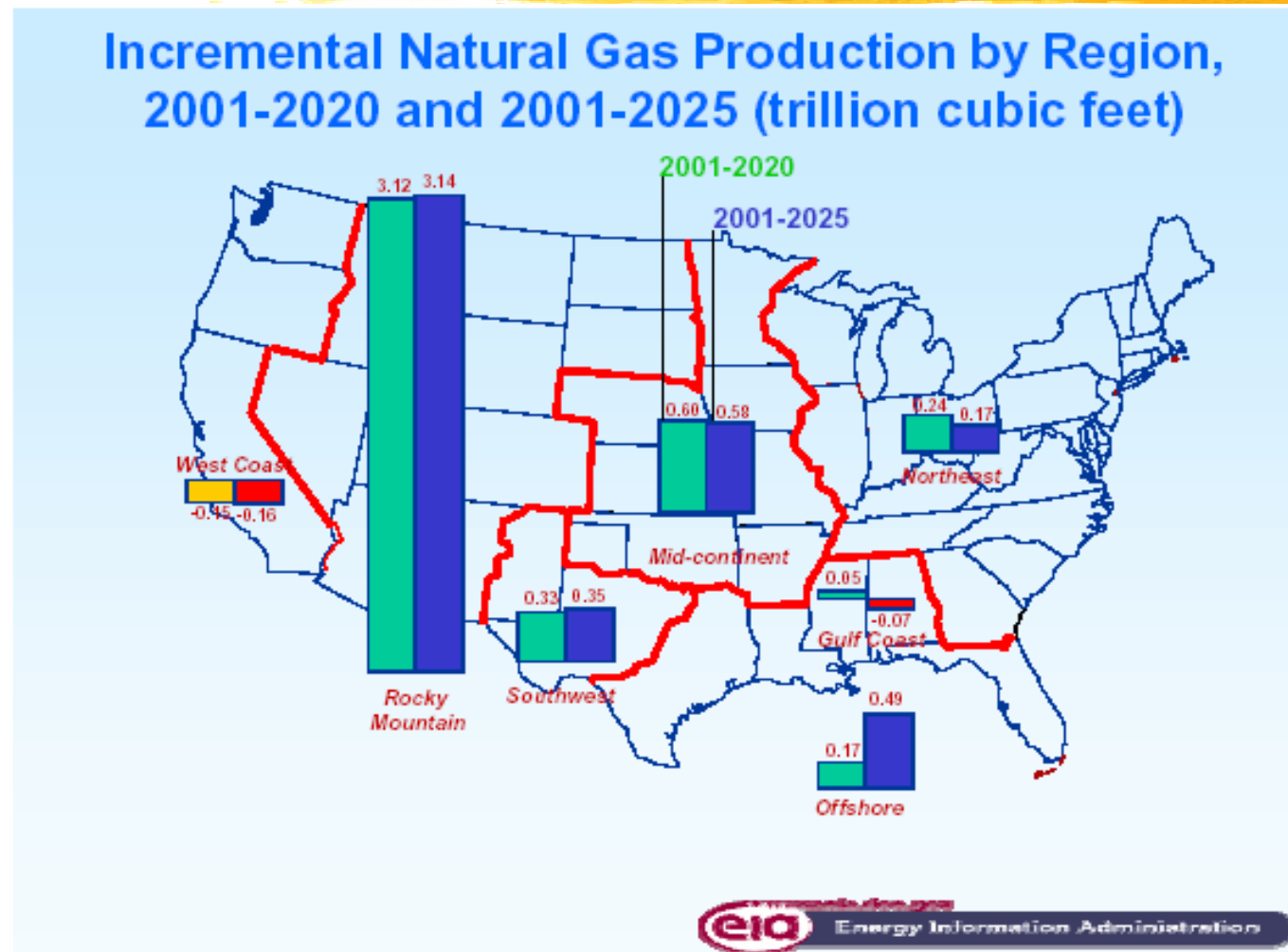
Source: Energy Information Administration, Advance Summary of U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 2002 Annual Report



U.S. natural gas demand increase primarily related to increased use of natural gas in power plants from 2008 onward



Expected growth in U.S. domestic natural gas production, 2001 - 2025



Downgrading of Canadian import projection by DOE: Legitimate, political, or bit of both?

Top: July 03 DOE EIA projection; Bottom: Jan 04 projection; DOE Sec. Abraham opening comments, LNG Summit, Dec 03

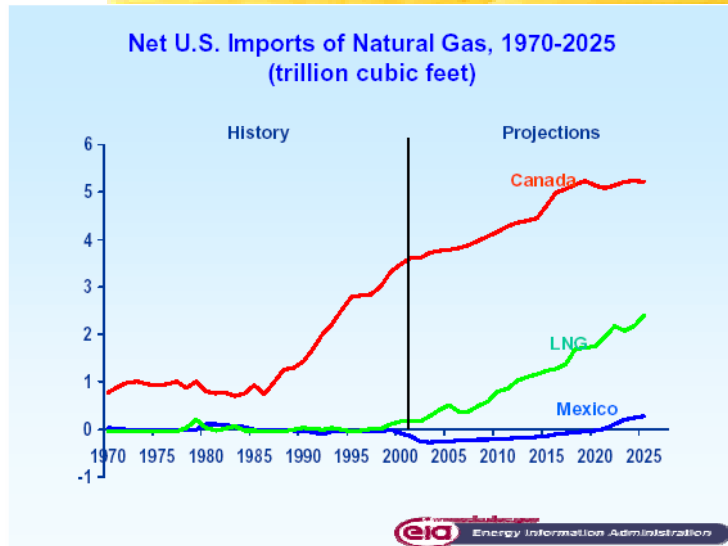
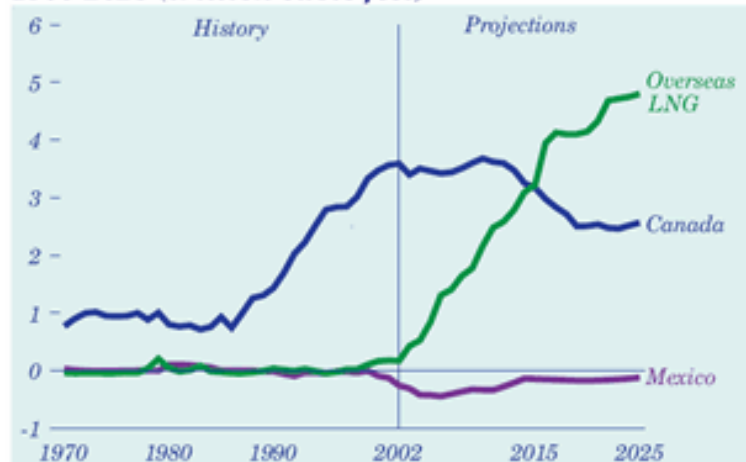


Figure 89. Net U.S. imports of natural gas, 1970-2025 (trillion cubic feet)



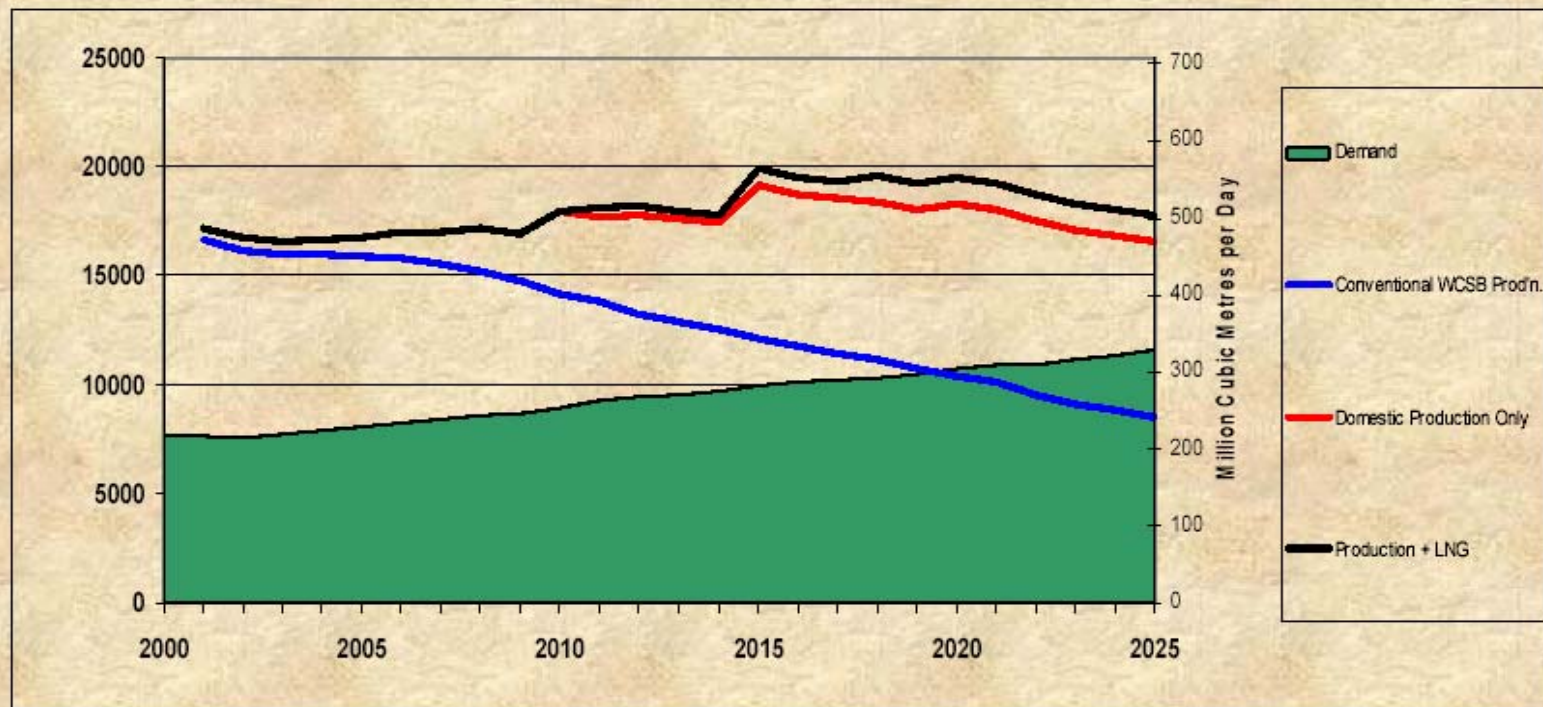
DOE Sec. Abraham, Dec 2003:

- We need the contribution of a large and growing market in imported Liquefied Natural Gas;
- We are here at this [LNG] Summit to discuss ways to make that market a reality;
- To meet our energy needs, the United States will have to become a much larger importer of LNG than it is today;
- Imports could account for 15% of our natural gas supply in 2025 - that should give you some sense of how important a large and efficient global LNG market is to us.

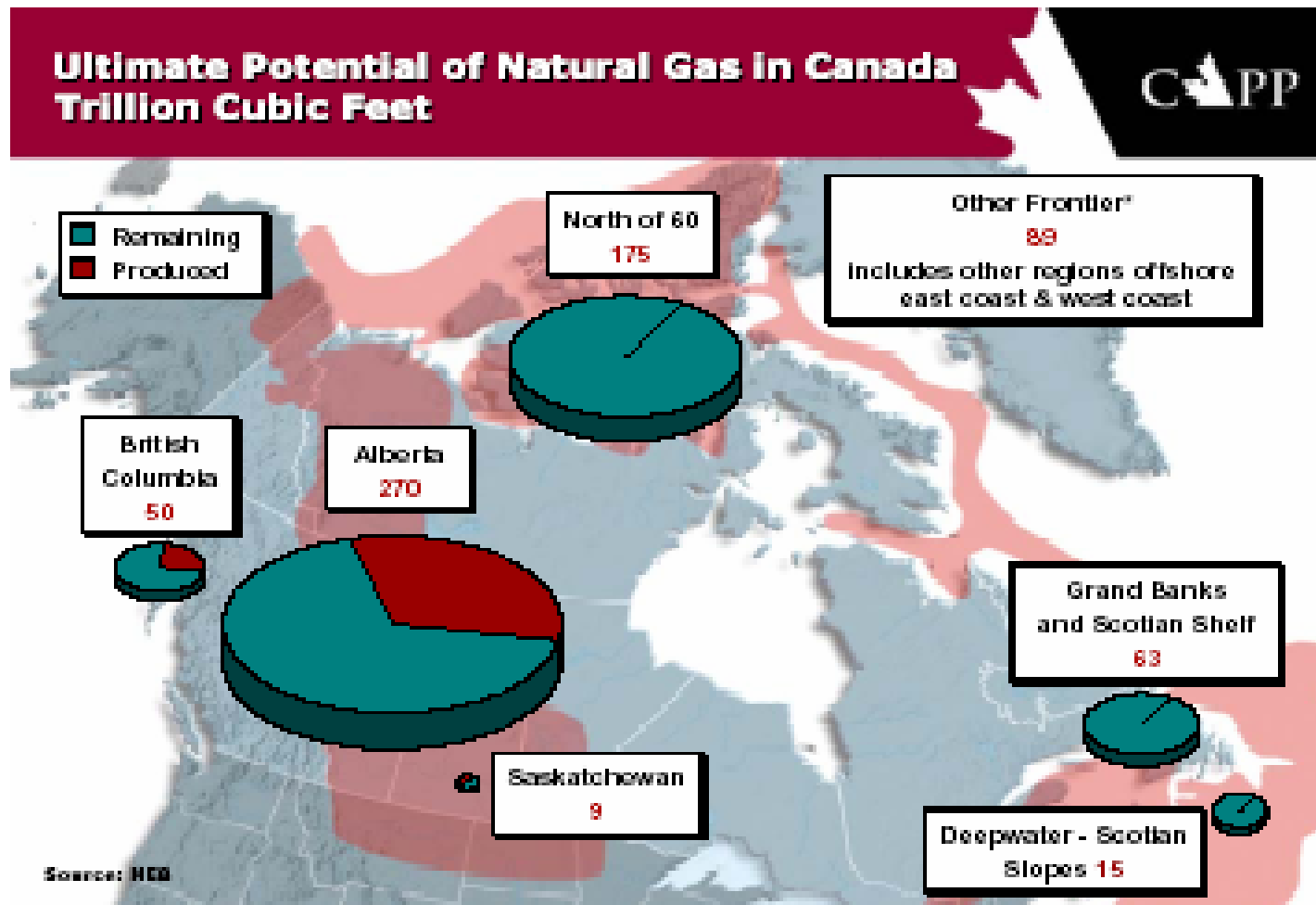
What do the Canadians think? Somewhere in between the DOE '03 and '04 projections.

From: Joe Lemée - Supply Specialist, National Energy Board, *Canadian Gas Supply 1980 – 2025*, NEMS/AEO Conference, March 23, 2004. "Techno-Vert" means technology advances rapidly w/ preference for clean burning fuels.

Canadian Gas Supply vs. Domestic Demand Techno-Vert (MMcf/d)



Canadians estimate large remaining gas potential, > 100x California's annual usage, in Alberta alone [remaining potential > 250 Tcf, CA usage 2 Tcf/yr]

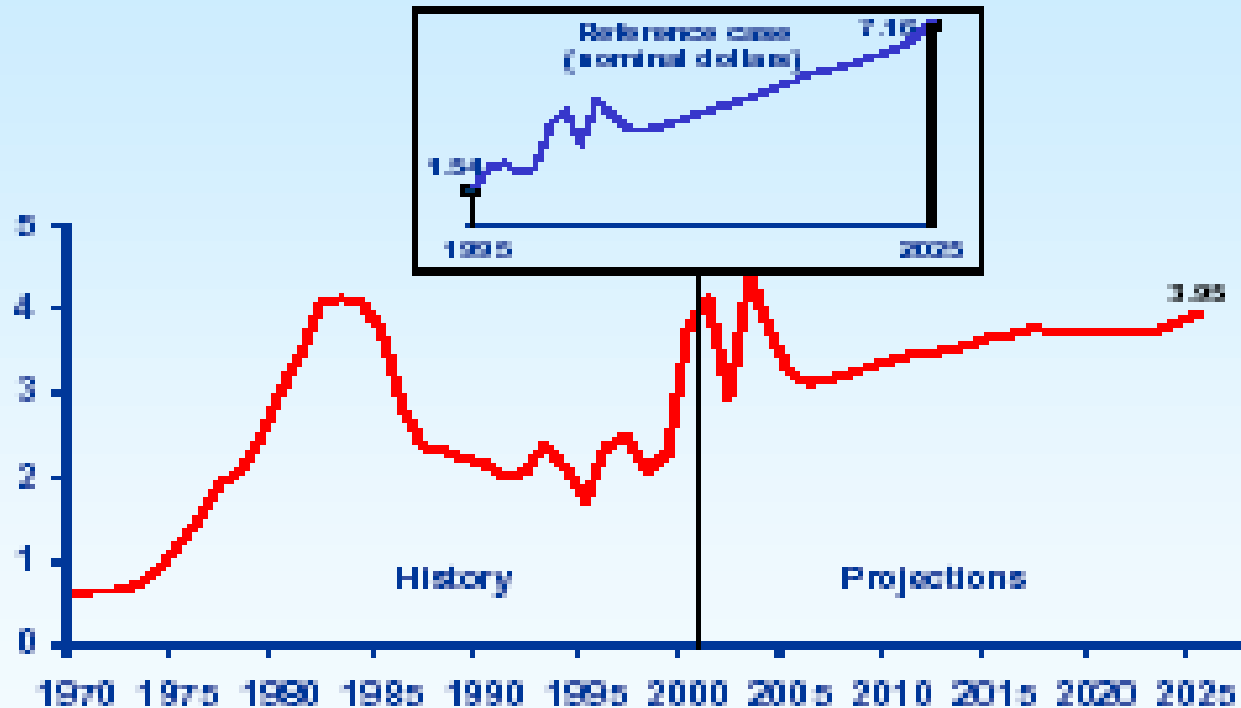


Will the arrival of LNG reduce the price of natural gas? No.

- What the Department of Energy says:
 - Natural gas price will drop considerably over next two years, then slowly rise to \$3.50/MMBtu in 2015 timeframe, and continue to \$3.95/MMBtu (wellhead price adjusted to 2001) by 2025;
 - Cost to get LNG to California is well over \$4/MMBtu;
 - Cost to get LNG to Baja California is \$3.40/MMBtu;
 - DOE projection assumes no LNG on West Coast until 2020.
- What some LNG developers say:
 - Natural gas price is high and will go much higher without LNG to stabilize regional market
- No consensus among government and industry analysts whether LNG will have any impact on price

July 2003 DOE projection: Current high natural gas prices seen as spike, dropping to ~ \$3/MMBtu wellhead price by 2006

Lower 48 Natural Gas Wellhead Prices,
1970-2025 (2001 dollars per thousand cubic feet)

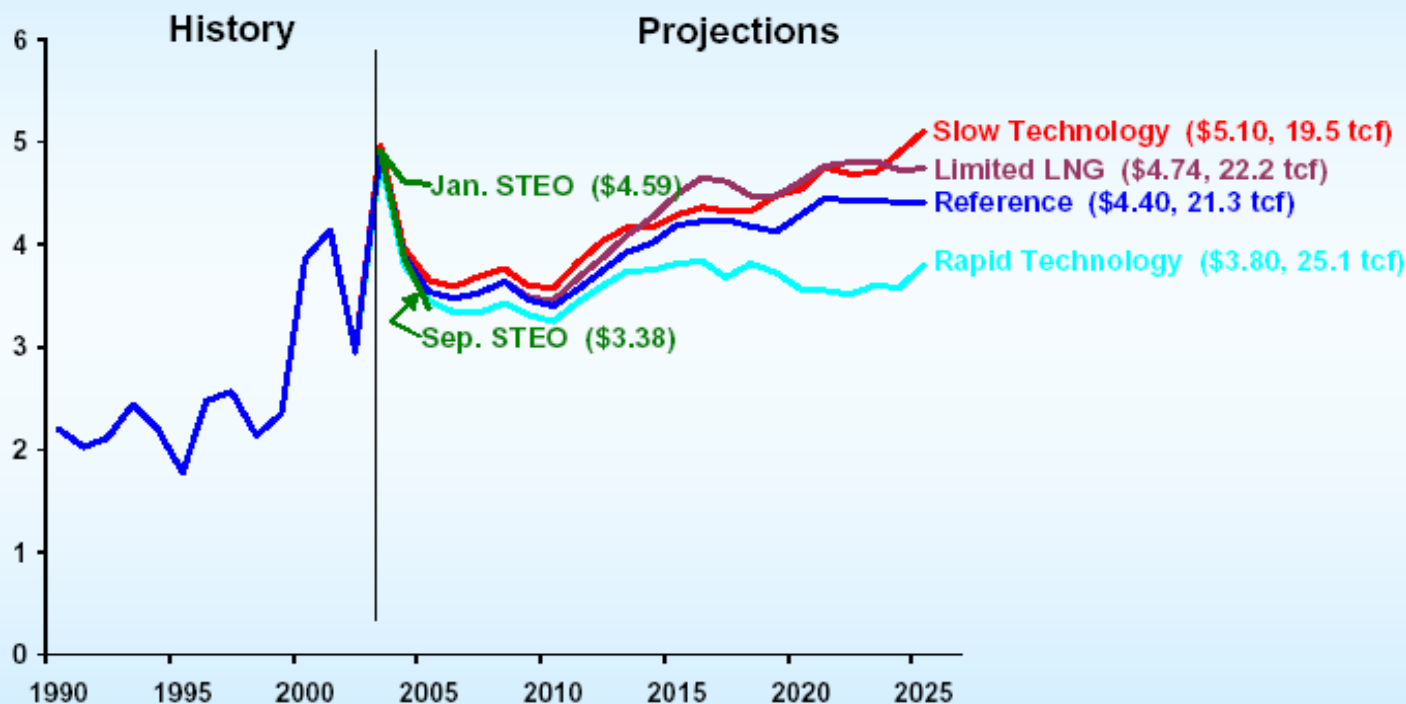


U.S. Energy Information Administration

March 2004 DOE projection: Natural gas price beyond 2013 influenced by pace of technology

From: Dana Van Wagoner, DOE EIA, *Domestic Natural Gas Supply: A Large Resource Base Does Not Guarantee Low Long-Term Prices*, NEMS/AEO Conference, March 23, 2004

Natural Gas Wellhead Prices (2002 dollars per thousand cubic feet)

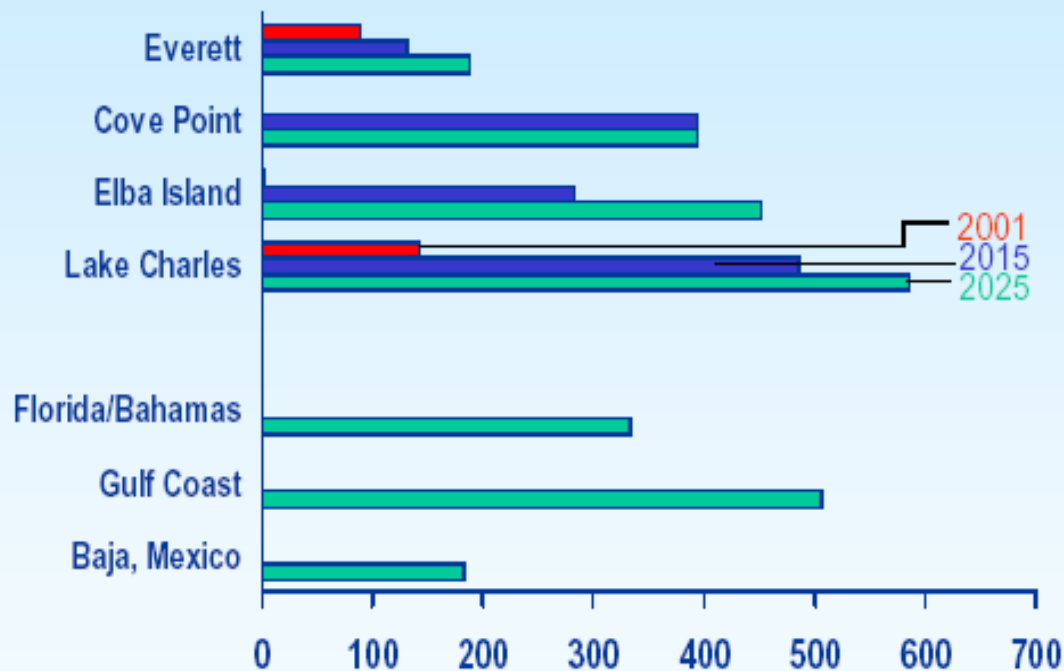


Values in parenthesis = (average lower 48 wellhead price, lower 48 production)



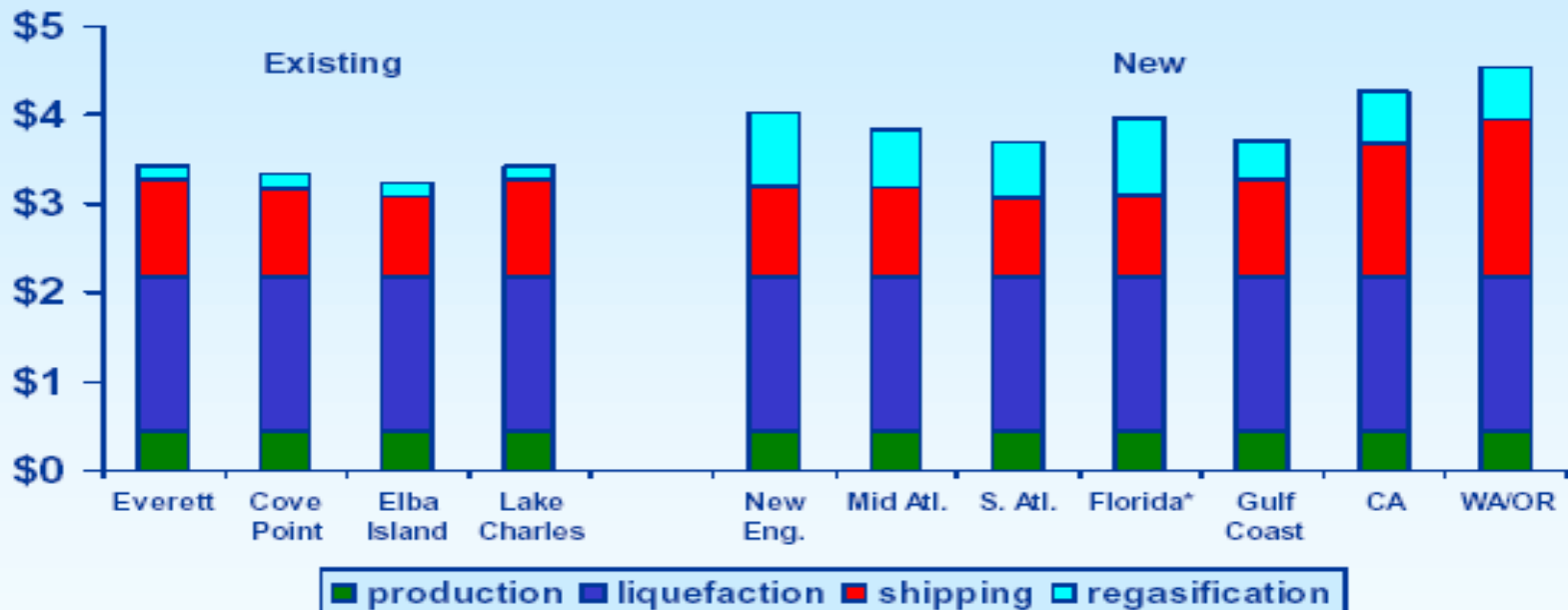
DOE projects one LNG terminal on West Coast, in Baja California around 2020, in business-as-usual gas usage scenario

LNG Imports by Terminal
and/or Region, 2001, 2015, and 2025
(billion cubic feet)



Reason for no West Coast LNG is high cost relative to domestic gas, only Baja LNG becomes competitive around 2015-2020

Minimum Regional LNG Costs
(2001 dollars per thousand cubic feet)



* Regasification includes pipeline cost from Bahamas

DOE estimates cost of Baja California LNG at \$3.40/MMBtu (2001 adjusted), higher than CAPP cost estimate for Canadian gas

From: Greg Stringham, CAPP, March 23, 2004

WCSB Conventional Gas:

Production costs:

F&D Costs - \$0.80-\$1.50

Oper. & G&A - \$1.30

Royalties - \$0.45

Range: \$2.55-\$3.25

Transportation: \$0.35-\$1.30

Deliv. to Market: \$2.90-\$4.55

Converted to US\$ at \$0.75 exchange rate

LNG:

After Regasification

Range: \$3.25-\$4.50

Transportation - ?

Deliv. To Market: ?

Source: E.I.A.



Political Realities

Follow the money - LNG competitors and 2004 campaign/lobbying spending

From: CalAccess database – lobbying and contribution activity – www.cal-access.ss.ca.gov

Company	Contributions to Governor, 2004 (\$)	General Lobbying, Q2 2004 (\$)	CPUC Lobbying, Q2 2004 (\$)
Sempra/ SoCalGas/SDGE	100,000 (Feb 04, March 04)	328,000	739,000 (~\$12,000/business day)
ChevronTexaco	200,000 (Feb 04, Aug 04)	321,000	8,000
BHP Billiton	0	10,000	0
Mitsubishi (SES)	0	21,000	0
PGE (for comparison purposes)	200,000 (Feb 04)	281,000	177,000
Edison Inter./SCE (for comparison purposes)	50,000 (Dec 03)	258,000	18,000

Politics of Baja LNG, Part 1

Candidate Schwarzenegger's Energy Policy Statement September 2003	<i>"Current LNG proposed projects for construction in Baja California will facilitate imports from Bolivia, Alaska, and other sources."</i> <u>Note</u> : No mention of CA LNG projects. Only Sempra pursuing Bolivia and Alaska LNG in September 2003.
CPUC initial natural gas/ LNG rulemaking, January 2004	CPUC recognizes LNG as inherently beneficial, supports open utility access to LNG supplies. Closed process, no evidentiary hearings.
Sempra letter to Greenpeace, Chevron Texaco quote in UPI Mexico, May and Sept 04	Sempra states it will sell 50% of LNG into Baja at startup, 100% by ~2015, ChevronTexaco says 70% to Baja at startup. <u>Note</u> : Current Baja demand is 100-150 mmcf/d.
California LNG project developers, December 2003 - August 2004	CA LNG developers make public statements that no utility ratebased support necessary - competitive, unsubsidized market scenario.

Politics of Baja LNG, Part 2

Sempra letter to CPUC opposing evidentiary hearings and advocating preferential treatment for LNG at border June 2004	States LNG means lower natural gas prices for all California consumers. Opposes evidentiary hearings. Advocates for rate recovery for SDGE upgrades necessary to receive gas from border. States Phase I decision will determine financial commitments by Sempra and project investors.
CPUC final natural gas/LNG rulemaking September 2004	Recognizes affiliate transaction conflicts of interest between LNG developer Sempra and SoCalGas/SDGE (owned by Sempra), does not bar such transactions. Decision incorporates most/all requests in Sempra June 2004 letter.
Request for rehearing of final decision, October 2004	In progress.

Why “open access” for LNG is anti-competitive

- Open access means all LNG projects have the potential for utility core customer contracts, the “gold standard” in project finance;
- California LNG projects have stated they do not need access to ratebased contracts and will contract with non-core market;
- A competitive market should reward the most efficient project, not lower the bar so that lesser projects can compete on equal footing;
- Failure to ban affiliate transactions between Sempra and SoCalGas/SDGE will almost certainly lead to “gold standard” supply contracts for Sempra that facilitate construction of a lesser project in Baja, on the back’s of ratepayers and the environment, at the expense of superior LNG projects in California that seek no ratebased support.

High cost of bringing LNG to West Coast make it an uncertain investment in free market – utility core contracts needed

- CA demand is declining, rebound with business-as-usual approach to 2002 peak year around 2016;
- DOE states cost to deliver LNG to CA greater than \$4/MMBtu, while projecting domestic natural gas at less than \$4/MMBtu through 2025;
- Cost of LNG supply chain infrastructure is high, \$3-5 billion, requires large amounts of debt financing;
- Financial institutions suffered heavy losses in merchant power projects – risk averse;
- Bottom line: LNG project developers want long-term contracts w/invest grade entities like California utilities to hedge the financial risk and increase project attractiveness to investment community.

^{a)} James Kendell, DOE EIA, *Current Natural Gas and LNG Projections*, NARUC Conference, July 29, 2003.



Risk, Safety, and Environmental Impacts of LNG Operations:

Do We Understand the Price
That Will Have to Be Paid?

What is California and U.S. history with LNG terminals?

- California LNG Terminal Act of 1977 (rescinded 1987):
 - *Fire risk from LNG spills of 25,000 m³ and 125,000 m³ evaluated as basis for safety buffer zone*
 - *Restricted population density to 4 miles from fenceline, same for tanker shipping lanes;*
 - *Power of eminent domain granted to terminal operator to maintain low population densities*
- *1979 Federal Pipeline Safety Act explicitly states “need to encourage remote siting”*

How are LNG projects in California being designed?

Project	Upstream gas field and liquefaction facilities	Downstream regasification facilities	Distance to civilians
BHP Billiton off Ventura County	NW Australia, floating offshore	Floating offshore, 15 miles from coast	> 15 miles
Mitsubishi Long Beach Harbor	Sakhalin (Russia) onshore: Gas from critical Western Gray Whale caving ground, 600 km. pipeline through virgin region.	Onshore in urban/ industrial setting, removal/storage of propane and ethane onsite	< 2 miles

Note: Neither of these projects use seawater to regasify the LNG

How are LNG projects in Baja California being designed?

Project	Upstream gas field and liquefaction facilities	Downstream regasification facilities	Distance to civilians
Sempra/ Shell Near Ensenada, 50 mi. from border	1) <u>Sempra</u> : virgin site in New Papua, political instability, potential militarization risk, onshore on site of village moved without prior consent, in SE Asia's largest mangrove forest. 2) <u>Shell</u> : virgin site Sakhalin offshore/onshore, gas from critically endangered Western Gray Whale only caving ground, 600 km. pipeline through virgin region.	onshore, last undeveloped stretch of Baja coast north of Ensenada. Coast zoned for tourism, rustic use.	2 miles
Chevron Texaco 10 mi. from border	Onshore at Barrow Island, known as NW Australia's "Ark" – invasive species issue.	offshore 600 m. from island – critical marine avian habitat	8 miles

Note: Both of these projects will use ~ 100 million gal/day of seawater each to regasify the LNG

Global Warming – How much CO₂ in gas being converted to LNG?

Project	CO ₂ % of source gas	Fraction of source gas that is combustible excluding CO ₂ portion ^c (assume combustible portion is pure methane)	Increase in % CO ₂ emissions relative to pure methane combustion w/o sequestration ^c
ChevronTexaco <i>Gorgon, NW Australia</i>	11 – 15 ^a	.85 - .89	12 - 18
Sempra/Shell <i>Tangguh, New Papua, Indonesia</i>	~10 ^b	.90	11
BHP Billiton <i>Scarborough, NW Australia</i>	<1	>.99	<1

Note (a): The CO₂ would have to be vented to atmosphere or sequestered

Note (b): BP Tangguh EIA webpage

Note (c): If 10% of source gas is CO₂, assume remaining 90% is combustible methane gas.

Global warming and air pollution: How much gas is used to make, transport, and regasify LNG?

Process Step	Additional Gas Consumption (%)
Wellhead extraction, field gas processing, pipeline transport of natural gas to user	basecase
Liquefaction	9-10
Transport from Far East via tanker	7-9
Regasification	2-3
Total additional natural gas consumed:	18-22

Transport note: Assumes 36-day round trip and 0.20 to 0.25% of LNG cargo consumed per day of voyage by onboard fuel requirements

What is cumulative additional CO₂ associated with Pacific LNG?

Project	Increase in % CO ₂ emissions ^b	Increase in % CO ₂ from LNG liquefaction, transport, and regas	Total increase in % CO ₂ emissions relative domestic low CO ₂ production field
Domestic low CO ₂ production field ^a	basecase	0	basecase
ChevronTexaco <i>Gorgon, NW Australia</i>	12 - 18	20	~30-40
Sempra/Shell <i>Tangguh, New Papua, Indonesia</i>	11	20	~30
BHP Billiton <i>Scarborough, NW Australia</i>	basecase	20	~20

Note (a): Assumes CO₂ content of field gas is less than 1% by volume

Note (b): Assumes wellhead CO₂ is vented to atmosphere and not sequestered

Seawater LNG vaporization – What is the marine impact?

- 100,000,000 gallons/day of seawater used
- Mortality of entrained marine life is 100%;^a
- Once-through seawater usage rate is equivalent to that of a 300 MW combined-cycle power plant;
- Seawater temperature is reduced by as much as 20 °F
- U.S. Coast Guard has stopped permit application review for 3 offshore LNG projects in Gulf of Mexico over concern about cumulative impacts of so much seawater regas use.^b

a) *May 2003 USCG EIS for proposed Port Pelican LNG terminal and July 15, 2003 envr coalition comment letter on USCG EIS. See www.borderpowerplants.org*

b) *September 15, 2004, State Lands Commission, Prevention 1st 2004 Conference – LNG Session, Long Beach. Halt to permit processing due to seawater regasification issue noted by both USCG and industry commentators during Q&A portion of session.*

Site of proposed Semptra/Shell LNG regasification terminal



LNG and the public interest – allow access to pipeline networks, prohibit access to taxpayer (core) cost recovery

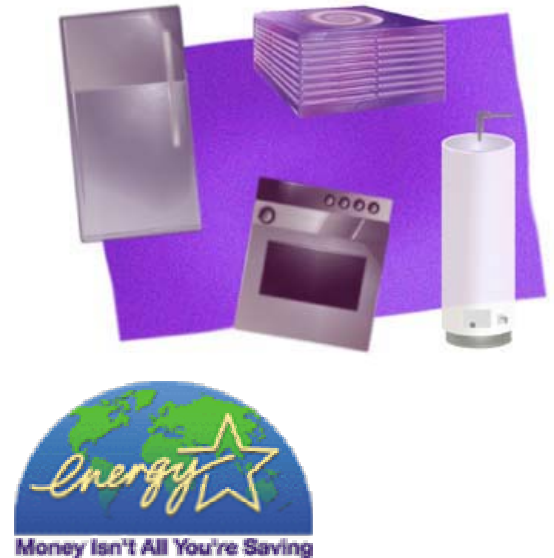
- All three California LNG project proponents have stated they do not need any ratebased utility support to move forward;
- An LNG project that is financed without any ratepayer support to access the non-core gas market will not hurt the ratepayer, or put the ratepayer at risk for a potential white elephant;
- The two Baja project proponents have stated they will sell most/all of their LNG supply in Baja California, clearly indicating California is a secondary market for their LNG supplies.

Therefore:

- All LNG projects should be “at risk,” meaning no potential for risk free utility contracts or ratebased infrastructure cost recovery;
- LNG access should be limited to access to bid on pipeline capacity to get LNG supplies to non-core customers;
- Restricting LNG access to pipeline capacity only, while prohibiting LNG access to utility supply contracts or ratebased infrastructure cost recovery, sets a “high bar” competitive standard for LNG projects and eliminates the possibility of affiliate transaction conflicts of interest.

The clean energy option

- Gas demand is static, no growth in 2002-2016,
- Demand and price can be decreased considerably by aggressively implementing energy conservation renewable energy,
- Potential to reduce natural demand by the equivalent of at least 2 LNG terminals,
- Best environmental, fuel price, and public policy.



California and natural gas needs – Increase supply or decrease demand?

Gas Demand, Projected Demand Increase, Gas Options	Gas Quantity, mmcf/d (million cubic feet per day)
Average daily natural gas use in California, 2003	6,000
Projected increase in gas demand by 2016 over 2002 baseline	~0 ^a
Average projected daily natural gas delivery from one LNG terminal	700-800
Reduction in California gas demand from conservation measures and renewable energy supplies identified as cost-effective priorities by state	1,500+ ^b

Note (a): From presentations by CEC, PGE, SoCalGas/SDGE at CEC/CPUC Natural Gas Workshop, Dec. 9-10, 2003. 2006-2016 demand increase in SoCalGas/SDGE territory: 0 mmcf/d; in PGE territory: 0-200 mmcf/d; CEC statewide: ~0 mmcf/d.

Note (b): Derived from Synapse Energy Economics evaluation submitted in March 23, 2004 RACE coalition comments in CPUC Utility Long-Term Natural Gas Procurement Proceeding, Rulemaking 04-01-25. 30,000 Gwh of electric power saved through improved energy efficiency; 30,000 Gwh saved through accelerating renewables from 20% to 30% in 2017. 30,000 Gwh ~ equal to gas throughput of one LNG terminal. Assume 8,000 Btu/kwh mean heat rate for electricity production. Additional savings possible through accelerated retirement of coastal utility boiler plants and community choice commitments to 40% RPS by 2017.

What is the cost of energy options for California?

Energy Options ^a and 2004 Residential Power Rates	\$/kwh ^b
Natural gas combined-cycle power plant (baseload)	0.05
Natural gas simple cycle power plant (peaking)	0.16
Wind	0.05
Solar thermal (parabolic trough)	0.14 – 0.17
Geothermal (flash)	0.05
Energy conservation measures ^c	0.03 – 0.06
San Diego Gas & Electric 2004 residential charge	0.15 ^d
CFE, North Baja California 2004 residential charge	0.22 ^e

Note (a): California Energy Commission, *Comparative Cost of California Central station Electricity Generation Technologies*, August 2003, pg. 3 and 11.

Note (b): “levelized direct cost” – assumes life-of-project natural gas cost in \$5/MMBtu to \$6/MMBtu range.

Note (c): California Consumer Power and Conservation Financing Authority, *Clean Growth: Clean Energy for California’s Economic Future – Energy Resource Investment Plan*, February 2002, Table 6-2, pg. 54.

Note (d): Includes only metered kwh usage charge and “electric energy charge,” April 2004.

Note (e): Includes only December 2003 published CFE summer usage charge based on 1,000 kwh/month.

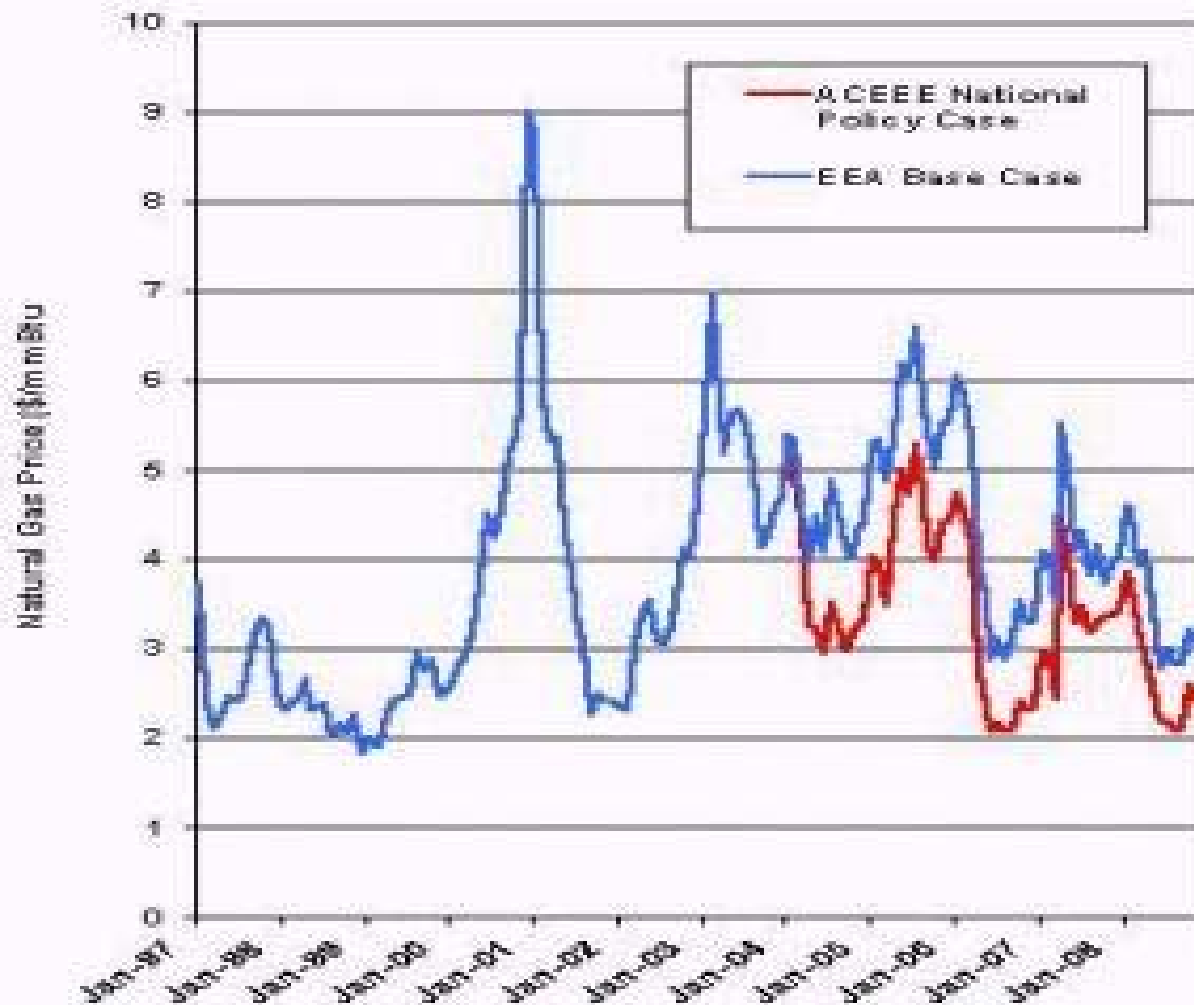
Impact of efficiency, community choice, renewables – High renewables % competes well with utility rates

- CA reduced peak electricity demand by 11% in late spring of 2001 and helped break market power;^a
- Saving peak energy fastest way to reduce gas usage and price - 20% price reduction, \$0.90/MMBtu, possible in 12 months;^a
- Sept 2004: 40 cities/counties seeking to go community choice, 22 have committed to 40% RPS by 2017, other 18 yet to disclose RPS commitment;^b
- These 22 cities/counties, plus San Francisco, represent ~15-20% of statewide electricity load;
- Sept 2004: Navigant study – even in worst case scenario with H bond direct financing (San Francisco approach), no rate increase with 40% RPS – low cost energy efficiency programs neutralize higher cost of renewables.

a) American Council for an Energy-Efficient Economy, *Impacts of Energy Efficiency and Renewable Energy on Natural Gas Markets*, December 2003.

b) Comments of Paul Fenn, Local Power, summarizing presentations at Law International's *New Directions for California Energy Markets* seminar, Sept. 16-17, 2004, San Francisco.

ACEEE – National effect of efficiency and renewables on natural gas price



Gas demand reduction is best public policy approach

- Tremendous public support for renewables;
- Conservation effort in spring 2001 probably most unifying event among CA citizenry in last 25 years;
- That spirit of common cause can be harnessed again;
- The public interest would be best served by decreasing demand aggressively with efficiency and renewables, not increasing supply via LNG;
- Biggest political obstacles to implementing demand reduction policy will be utilities and companies in natural gas and LNG supply business;
- Outstanding opportunity to show leadership, vision, and political independence.